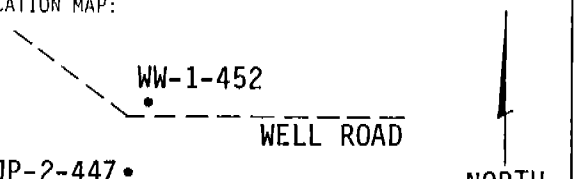
LITHOLOGIC LOG

LOCATION MAP:



NE 1/4 NE 1/4 NE 1/4 SE 1/4 S 6 T 21S R 3E

SITE ID: NASA-WSIF LOCATION ID: JP-2-447

SITE COORDINATES (ft.):

N 225325.05 E 397477.96

GROUND ELEVATION (ft. MSL): 4446.17 (Brass Cap)

STATE: NEW MEXICO COUNTY: DOÑA ANA

DRILLING METHOD: AIR-FOAM ROTARY

DRILLING CONTR.: LARJON

DATE STARTED: 2 AUGUST 1988 DATE COMPLETED: 15 AUGUST 1988

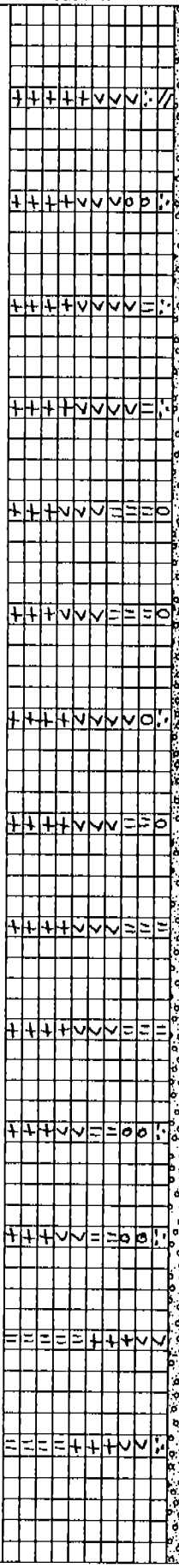
FIELD REP.: J. KIRBY, R. COOPER

COMMENTS: 9 7/8" pilot hole 0'-110', 14 3/4" borehole 0'-110', 9 7/8" borehole 110'-470'. Total depth = 470. Top of bedrock not reached.

LOCATION DESCRIPTION:

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
5			3	0'-470' cuttings	0'-470' SANTA FE GROUP ALLUVIUM: Unwashed samples are moderate orange pink (5YR 8/4) to light brown (5YR 6/4) due to clay and/or matrix content. Washed samples have varied color due to different lithologies of the cuttings but have an overall color of medium gray (N5) to dark gray (N3). Cuttings range in size from silt size (<0.5 mm, <0.02 inches) to 10 mm (0.4 inches). The average cutting size is between 2 and 3 mm (0.08-0.12 inches). Cuttings are rounded to angular. Subrounded to rounded cuttings are smaller, whole clasts from the alluvium. A poorly- to moderately-consolidated, pebble to cobble alluvium with intermittent clay and caliche zones. Alluvium contains clasts of light gray (N7) to grayish black (N2) micritic limestone with < 10% allochems; white (N1) calcite; white (N9) and red and white mottled rhyolite with varying amounts of iron staining; light olive gray (5Y 3/2) and very dark red (5R 2/6) andesite with some pyroxene alteration to epidote; translucent bluish white (5B 9/1) to light bluish gray quartz; iron stained quartzite; iron-stained calcite-cemented quartz sandstone; moderate reddish orange (10R 6/6) to moderate reddish brown (10R 4/6) granite; moderate red (5R 4/6) to moderate reddish brown (10R 4/6) and greenish gray (5GY 6/1) to greenish gray (5G 6/1) siltstone; very pale orange (10YR 8/2) to pale yellowish brown (10YR 6/2) caliche; moderate orange pink (5YR 8/4) to light brown (5YR 6/4) clay varying from < 10% to 50% of sample. The clay from intervals containing abundant clay often forms balls when the samples are washed. Reaming in and out of borehole was necessary due to swelling clays. EZ-Mud was used in the drilling fluid to reduce the swelling. The amount of carbonate cuttings decreases, and the amount of igneous cuttings increases with depth. Amount of andesite cuttings increases significantly and rhyolite decreases slightly with depth.
10			12		
15			9		
20			3		
25			5		
30			3		
35			3.5		
40			2		
45			2		
50			3		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
50			3		5'-10' Decrease in clay content. 10'-15' Decrease in caliche content, increase in limestone content. 30'-45' Increase in clay content.
55			5		
60			2		60'-70' Increase in clay content.
65			2		
70			3		70'-75' Decrease in clay content.
75			3.5		
80			4		
85			2		
90			2.5		90'-115' Increase in amount of caliche and caliche coatings and cutting size [max. 12 mm (0.48 inches), average 5 mm (0.2 inches)].
95			2.5		
100			3		
105			2.5		
110			3		
115			5		115'-170' Slight decrease in cutting size to an average size of 3 mm (0.12 inches). This interval has intermittent caliche zones.

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
115			5		
120			4		
125			10		125'-315' Abundant clay content in cuttings ranges in value from 10-50%. Caliche is also found sporadically in this interval.
130			5		
135			3.5		
140			4		
145			4		
150			4.5		
155			3		
160			4		
165			2.5		
170			3		170'-210' Slight decrease in cutting size to an average size of 1-2 mm (0.04-0.08 inches).
175			4		
180			5		

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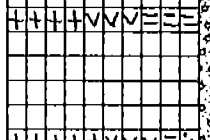
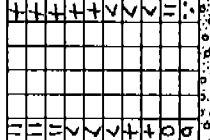
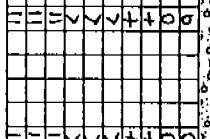
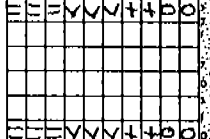
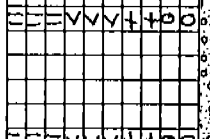
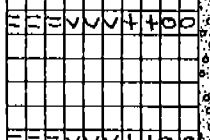
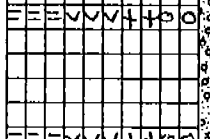
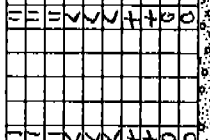
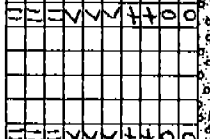
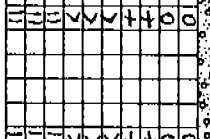
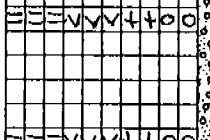
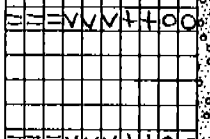
Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
180			5		
185			5		185'-470' Igneous clasts become the predominant clast. Andesite content increases and rhyolite content decreases with depth.
190			4		
195			3		195'-210' One sample gathered for this 20' interval.
200			3		
205			7.5		
210			3		210'-230' One sample gathered for this 20' interval. Slight increase in average cutting size to 3 mm (0.12 inches).
215			2		
220			2		
225			3		
230			3		230'-250' One sample gathered for this 20' interval. Decrease in average cutting size to 1-2 mm (0.04-0.08 inches).
235			2		
240			2		
245			2.5		

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Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
245			2.5		
250			2.5		250'-270' One sample gathered for this interval.
255			3		
260			4		
265			4		
270			4		270'-290' One sample gathered for this interval.
275			2		
280			2.5		
285			4		
290			5		290'-310' One sample gathered for this interval. First noticeable amounts of epidote in andesite cuttings.
295			2		
300			3		
305			4		
310			3		

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Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
310			3		
315			7		
320			5		320'-325' Increase in average cutting size to 3 mm (0.12 inches).
325			6		325'-335' Decrease in average cutting size to 1-2 mm (0.04-0.08 inches).
330			5		
335			3		335'-355' Slight increase in average cutting size to 2-3 mm (0.08-0.12 inches).
340			7.5		
345			5.5		
350			5		
355			6		355'-365' Slight decrease in average cutting size to 1-2 mm (0.04-0.08 inches).
360			4		
365			4		365'-385' Slight increase in average cutting size to 2-3 mm (0.08-0.12 inches).
370			5		
375			2		

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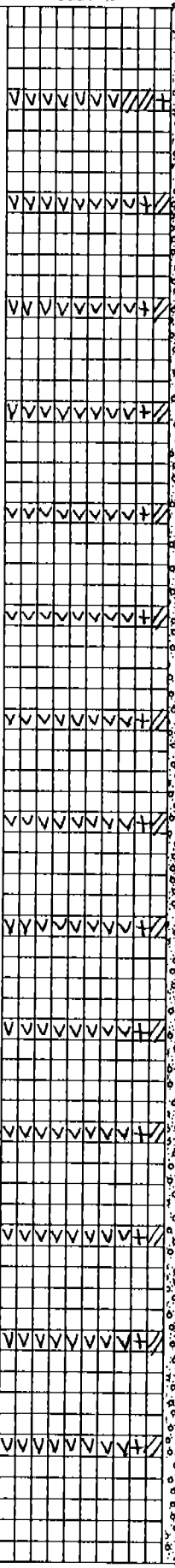
Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
375			2		
380			4		
385			4.5		385'-390' Slight increase in average cutting size to 3-4 mm (0.12-0.16 inches).
390			7		390'-450' Slight decrease in average cutting size to 2-3 mm (0.08-0.12 inches).
395			4.5		
400			4.5		
405			15		
410			4		
415			7		
420			4		
425			5		
430			6		
435			3		
440			5		

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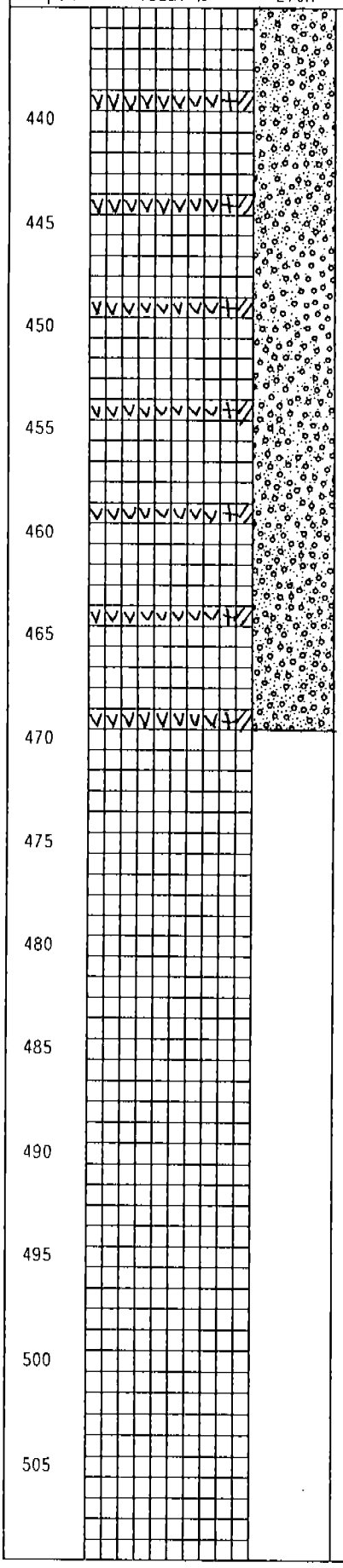

Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
5		
5		
6		450'-470' One sample gathered for this interval. Cutting sizes range from a silt size (<0.05 mm) to 2 mm (0.08 mm).
5		
9.5		460'-470' Heaving sands in this interval. After cuttings are blown out and the bit is raised, the bit sticks from the hole sloughing around it approximately 9 to 10 feet.
5.5		
9		Total depth = 470'.